

NOTES ON THE LEAF-CUTTING ANTS, *ATTA* SPP., OF THE UNITED STATES AND MEXICO

(HYMENOPTERA: FORMICIDAE)

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This article discusses and keys the species of *Atta* that occur in the United States and Mexico, makes pertinent comments on their biology and other matters, and gives the known distribution records. A key based on major workers is presented for the identification of the species. Keys are not offered, however, for the identification of intermediate workers, females and males, since these castes are much more difficult to identify. Anyone attempting to collect or study *Atta* is urged to secure especially major workers, although it may be necessary to dig deeply into a nest to secure these individuals.

For many years the various species of *Atta* were badly confused by students of this group of ants; one was therefore reluctant to accept unquestionably all identifications or distribution records. However, it is now possible, with Borgmeier's (1959) excellent revision, to identify the various species with ease and accuracy.

Two species of *Atta* are known to occur in the United States: The common *texana* (Buckley); and *mexicana* (F. Sm.), which barely enters its southern border in Arizona. Mexico has three species: The common *mexicana*; *texana*, which occurs in at least two of its north-eastern States; and *cephalotes* (L.), a Neotropical species which occurs in two of the more southern States. As far as known, Veracruz is the only State in which all three of the species have been found.

KEY TO THE SPECIES

(for the identification of major workers)

1. Each side of front of head bearing a dense clump or mass of rather long, yellowish or golden, woolly hairs; anterior end of frontal groove usually with a distinct or prominent ocellus. Southern Mexico through Central America to Bolivia and Brazil; a common and widely distributed Neotropical species **cephalotes** (L.)
- Each side of front of head not bearing a dense clump or mass of rather long, yellowish or golden, woolly hairs 2
2. Posterior portion of head (including occipital lobes and vertex) with a smooth and shiny appearance and either naked or almost free of hairs; first gastric segment similar; frontal groove of head shallow. United States (extreme southern Arizona) through Mexico to Honduras, Guatemala, and El Salvador; the most common and widely distributed species in Mexico **mexicana** (F. Sm.)
- Posterior portion of head and entire first gastric segment opaque, not naked; frontal groove of head rather strongly defined. United States (13 parishes in western Louisiana and much of the eastern part of Texas to approximately 101 degrees of longitude), and northeastern Mexico (States of Tamaulipas and Veracruz) **texana** (Buckley)

Atta texana (Buckley)

So far as known, the Texas leaf-cutting ant in the United States is confined to Texas and Louisiana. Its exact and detailed range has not yet been mapped. The ant may be said to occupy much of the area of Texas and Louisiana lying between the 101st degree of longitude in Texas and the 92.5th degree of longitude in Louisiana. In Texas this would include much of the area east of the 101st degree of longitude from the extreme southern border to almost the Oklahoma boundary line, with an extension into at least two States in northeastern Mexico. In Louisiana the following 13 parishes are definitely known to be infested: Bienville, Webster, Sabine, Vernon, Beauregard, Allen, Calcasieu, Jefferson Davis, Rapides, Natchitoches, Grant, Lasalle, and Winn. In Mexico, the species is known from *Tamaulipas*: Matamoros (R. L. McGarr). *Veraacruz*: Veraacruz (N. L. H. Krauss); 2 miles south of Mocambo (D. H. Janzen); Tecolutla (collector?).

A. texana does not have the wide distribution nor the great adaptability to various environments that *mexicana* has. It seems to show a decided preference for nesting in sandy or sandy loam soils but is also capable of nesting in heavy soils and in those of limestone origin. As early as 1907, Wheeler published excellent descriptions and figures of most castes of this ant and also gave an interesting account of certain phases of its general biology. Although *texana* has been known for many years to have habits similar to the Neotropical species of *Atta*, very little research has been done or published on *texana* by State and Federal agencies until recent years.

About 1935 the Southern Forest Experiment Station, U. S. Forest Service, New Orleans, Louisiana, began control work on this ant in the Kisatchie National Forest of Louisiana after recognizing it as an important pest of young pines, especially those used in reforestation. Begun under the direction of T. E. Snyder, these investigations resulted in publications by him (1937) and by M. R. Smith (1939). A more comprehensive paper on the biology and control of this ant was prepared by Walter, Seaton, and Mathewson (1938) of the Entomology Research Division, U. S. Department of Agriculture. Investigational and control work is being continued in the Kisatchie National Forest; much of the research work on biology is under the field direction of J. C. Moser. In early control work carbon bisulphide was used as a nest fumigant with considerable success. The chemical, however, had to be applied from late fall to early spring when the ants were concentrated in their nests and inactive. Johnson (1944) recommended methyl bromide as an even more effective nest fumigant. This method of control is now universally employed.

Atta mexicana (F. Sm.)

This species is known from only one locality in the United States, the Organ Pipe Cactus National Monument in Arizona (Byars, 1949). It was found in March 1946 near a gravel pit 5 miles north of the

Mexican boundary and 1 mile north of the Monument. *A. mexicana* is the most common species in Mexico and might well be called the Mexican leaf-cutting ant. It ranges from extreme southern Arizona through most, if not all, of Mexico to at least as far south as Honduras, Guatemala, and El Salvador. In Mexico the species is known from the following States and localities: *Jalisco*: Guadalajara (J. F. McClendon); 73 miles southeast of Guadalajara (H. A. Scullen); 10 miles south of Guadalajara (H. A. Scullen); 16 miles south of Encarnacion, 6,600 ft. (W. S. Creighton). *Durango* (all W. S. Creighton): Durango, 6,200 ft.; 25 miles south of Durango, 6,300 ft.; 10 miles south of Durango, 6,800 ft.; 7 miles east of Durango, 6,200 ft.; Rio Mexquital, Nombre de Dios, 5,900 ft. *Hidalgo* (all W. S. Creighton): Chapuhualcan, 2,600 ft.; Chapuhualcan, 3,500 ft.; 7 miles east of Jacala, 5,200 ft. *Sonora*: 10 miles south of Sonoyta, 1,400 ft. (W. S. Creighton); near La Casita, 3,500 ft. (L. F. Byars); near Magdalena, 2,460 ft. (L. F. Byars). *San Luis Potosi* (all W. S. Creighton): Tamazunchale, 600 ft.; Tamuin, 200 ft.; 2 miles east of Xilitla, 1,700 ft. *Nuevo Leon*: El Pastor (Montemorelos), 2,200 ft. (W. S. Creighton); Linares (Phil Rau). *Queretaro*: Queretaro (W. M. Wheeler); 27 miles east of Queretaro, 6,200 ft. (W. S. Creighton). *Tamaulipas*: 16 miles west of Altamira, 500 ft. (W. S. Creighton); Ciudad Victoria (V. E. Shelford); Llera (V. E. Shelford); Santander Jimenez (V. E. Shelford); Tampico (Loeke). *Aguascalientes*: 19 miles north of Aguascalientes, 6,300 ft. (W. S. Creighton). *Guanajuato*: Irapuato (C. H. T. Townsend); 5 miles north of Irapuato, 6,900 ft. (W. S. Creighton). *Nayarit*: Escuinapa (J. H. Battey); Tepic (G. Eisen and F. H. Vasil). *Morcos*: Cuernavaca (W. M. Wheeler), (I. A. Madariaga), (N. L. H. Krauss). *Veracruz*: Jalapa (A. L. Herrera); San Rafael (T. Pergande collection); Tuxpan ("American Consul"); Campo Coxtatla, 22 miles west of Veracruz (D. H. Janzen). *Distrito Federal*: Mexico City (C. Hibinger).

In Central America the species is known from the following places. *Honduras*: Tegucigalpa (D. Iseley). *Guatemala*: Guatemala City (F. Schwerdtteger); Yepocapa (H. T. Dalmat). *El Salvador*: San Salvador (O. L. Cartwright) (S. Calderon); San Andrés (E. J. Hambleton).

Concerning the high adaptability of this ant to its environment, W. S. Creighton *in litt.* remarks as follows ". . . The ant must have a very wide tolerance for different sorts of environments. The specimens which came from Sonora (10 miles south of Sonoyta, in a place locally known as Pozo Cypriano, which is to say Venus' puddle) were living in a thicket in the middle of a stretch of howling desert. There are few areas any less verdant than the region between Sonoyta and Puerto Penasco. So that particular station enables *mexicana* to rank with the most hardened xerophiles. But the colony from the station of Xilitla was living in a dense cloud forest, as were those from Tamazunchale and Chapuhualcan. The colony taken west of Jacala was in open deciduous woods that superficially resembled those of the south-

ern Appalachians. The colony taken west of Queretaro was in typical upland live-oak country. The colonies from Nombre de Dios, Irapuato and Aguascalientes were all in stream bottoms where trees of one sort or another were present, but the colony taken east of Durango was living on gravelly, outwash bajada where there were no trees at all, only thickets.—It is obvious that the type of environment means little to this species. It makes you wonder if *mexicana* may not have largely freed itself from a dependence on a particular type of environment because of its ability to 'air condition' its nests, coupled with the obvious fact that they can grow their fungus gardens on a wide variety of vegetable substances." It is also evident from the distribution records and data on altitudes that *mexicana* can inhabit areas from approximately sea level to at least 7,000 ft.

Atta cephalotes (L.)

In Mexico this species is known from the following places, *Oaxaca*: Tuxtepec (Dampf). *Veracruz*: Pueblo Nuevo (E. O. Wilson); Cordoba (Dampf).

This well-known Neotropical species extends from the southern part of Mexico through Central America as far south as Brazil and Bolivia. It is recorded by Borgmeier from Guatemala, Nicaragua, Costa Rica, Panama, Colombia, Ecuador, Peru, Bolivia, Surinam, British Guiana, Trinidad, Venezuela and Brazil. It is not listed by him from British Honduras, Honduras, El Salvador, nor from French Guiana but probably occurs in these countries. Except for *serdens* (L.), it is probably the most widely distributed species of *Atta*. Much of the literature on this species is in Portuguese or Spanish and is not readily available to many readers. Considerable investigational or control work on *cephalotes* has been conducted in Brazil, Surinam, and Trinidad.

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